

AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

On page 2, line 16, please replace the paragraph beginning with “The resin encapsulating apparatus” with the following amended paragraph:

The resin encapsulating apparatus using such a given amount extruding method of Fig. 1 has the following structure. A resin 1, such as an epoxy, having a viscosity is contained within a cylinder 2. This cylinder 2 is mounted on the cylinder holder 3. The cylinder holder 3 is arranged on an XYZ drive section 4 movable in XYZ directions (horizontal and vertical directions). The cylinder 2 is connected to a given quantity extruding device 6 via an air tube [[6]] 5. An air pressure control mechanism is provided at the given quantity extruding device 6. By the air pressure control mechanism, the liquid-like resin 1 of an amount necessary to the sealing operation is extruded from the forward end of the cylinder 2 and coated on a target member (here, a semiconductor chip mounted on a tape carrier).

On page 3, line 5, please replace the paragraph beginning with “At the resin encapsulating apparatus” with the following amended paragraph:

At the resin encapsulating apparatus, a conveying section 8 is provided for setting [[the]] a tape carrier 7 to a predetermined position and the liquid-like resin 1 is coated. For example, the tape carrier 7 is conveyed to a predetermined position. Further, the tape carrier 7 is positioned by a positioning block 9 and fixed in place. The cylinder 2 is moved by the XYZ drive section 4 to a coating position on the tape carrier 7. While moving the cylinder 2 in accordance with an initially registered pattern, a given amount of liquid-like resin 1 is coated on the tape carrier 7. By doing so, a predetermined portion of the chip is sealed.

On page 5, line 16, please replace the paragraph beginning with “FIGS. 3A to 3D are cross-sectional view” with the following amended paragraph:

FIGS. 3A to 3D are cross-sectional ~~[[view]]~~ views showing a resin coating section of a semiconductor device in the printing method using the resin encapsulating apparatus shown in FIG. 2. As shown in FIG. 3A, the tape carrier 10 with ~~[[the]]~~ a chip ~~[[11]]~~ 70 mounted thereon is placed on the positioning fixing block 12. The mask 13 having the opening 14 is set on the tape carrier 10. In this state, the resin 15 of a viscous nature is extruded on the mask 13. And the resin 15 is held by the squeegee 16 and, as shown in FIGS. 3B and 3C, the squeegee 16 is moved along the plane of the opening 14. By doing so, the resin 15 is buried in the opening 14. In the case where the resin 15 was so buried by the above-mentioned method, it follows that, since the resin 15 is relatively high in viscosity, it is not fully filled at the corners of the bottom of the opening 14. This poses a problem of producing a defective semiconductor device. Such a problem becomes prominent in a semiconductor device of such a type that the protective resin sealing body and balls for external connection are provided on the same surface side.

On page 11, line 26, please replace the paragraph beginning with “The cylinder 20 contains a viscous resin” with the following amended paragraph:

The cylinder 20 contains a viscous resin 31 and mounted on ~~[[a]]~~ the cylinder holder 21. The cylinder holder 21 is set on the XYZ drive section 22 movable in X, Y, Z (horizontal and vertical) directions. The given amount extruding device 24 is connected to a top section of the cylinder 20 through the air tube 23. The resin within the cylinder 20 is extruded from a forward end of the cylinder 20 by the air pressure control of the given quantity extruding device 24. The

squeegee 25 is made of aluminum, rubber, stainless, etc., and mounted on the cylinder holder 21 and arranged above the mask 29. The conveying section 27 is used to convey the semiconductor device to a predetermined position and fixes it in place. The mask 29 has an opening 30.

On page 12, line 16, please replace the paragraph beginning with “The positional relation of the cylinder 20 and squeegee 25” with the following amended paragraph:

The positional relation of the cylinder 20 and squeegee 25 is height-adjusted such that, taking the flexibility of the squeegee 25 into consideration, the forward end of the cylinder 20 is set to be higher than the lower surface of the squeegee 25. ~~[[The]]~~ A tape carrier 26 sets a chip to a predetermined position by a previous step not described here. The tape carrier 26 with the chip set there is conveyed by the conveying section 27 to a predetermined position and, after being positioned by the positioning fixing block 28, is fixed in place. Thereafter, the tape carrier 26 is moved by a block drive section (not shown) to a predetermined position and, by being moved up, pushed against the mask set on the conveying section 27. The mask 29 has the opening 30 in a way to correspond to the coating position of the resin 31.

On page 13, line 19, please replace the paragraph beginning with “Now the resin encapsulating method” with the following amended paragraph:

Now the resin encapsulating method used on the first embodiment will be explained below with reference to FIGS. 5A to 5D. FIGS. 5A to 5D are cross-sectional views showing a resin coating section of a semiconductor device in which the resin encapsulating method is used. In this resin encapsulating method use is made of the resin encapsulating apparatus shown in FIG. 4. The interval between the forward end of the cylinder 20 and the squeegee 25 is set to be

wider than the opening 30 in the coating direction. Here a brief explanation will be given about a semiconductor device on which resin sealing is performed. A chip 43, such as a silicon semiconductor, is set (mounted) on a tape constituting ~~[[a]] the~~ tape carrier 26. The tape carrier 26 comprises a tape and a plurality of leads (not shown) patterned thereon. The leads and electrode pads (not shown) on the chip surface are electrically connected by bonding wires (not shown).

On page 16, line 24, please replace the paragraph beginning with “As shown in FIG. 6A, a tape carrier” with the following amended paragraph:

As shown in FIG. 6A, ~~[[a]] the~~ tape carrier 26 with a chip 43 mounted (set) thereon is set on a positioning fixing block 28. A mask 29 having an opening 30 is set on the tape carrier 26. At this time, a position of ~~[[a]] the~~ mask ~~[[20]] 29~~ is set to allow the opening 30 of the mask 29 to correspond to a resin coating area on the chip 43.

On page 17, line 3, please replace the paragraph beginning with “Then, as shown in FIG. 6A,” with the following amended paragraph:

Then, as shown in FIG. 6A, ~~[[a]] the~~ cylinder 20 is moved to one edge portion of the opening 30 and a liquid-like resin 31 is extruded from an extruding hole of the forward end of the cylinder 20. Then the cylinder 20 is moved from one edge end to an opposite edge end as shown in FIGS. 6B and 6C while extruding resin 31 from its extruding hole. A somewhat greater amount of resin 31 than the capacity of the opening 30 is coated in the opening 30 from the extruding end of the cylinder. At this time, the squeegee 25 is located near to the cylinder 20 and, just after the resin 31 has been extruded from the extruding section, the squeegee 25 is

moved from behind the cylinder, that is, moved from one edge end similarly to the opposite edge end along the surface of the mask 29. By doing so, the resin raised from the surface of the mask 29 is fluidized by moving the squeegee 25. Further, any excessive resin 31 raised from the mask surface is removed by the squeegee 25. In this way, just after the resin 31 is partially extruded into the opening 30, the resin is moved by the squeegee 25 and, through such resin fluidization, the resin 31 is readily filled even into a hard-fill portion of the opening.

On page 18, line 6, please replace the paragraph beginning with “According to the resin encapsulating” with the following amended paragraph:

According to the resin encapsulating method used on the second embodiment, the liquid-like resin 31 is extruded directly into the opening 30 of the mask 29 from the extruding hole of the cylinder 20 and, therefore, the viscosity of the resin 31 never becomes higher and the resin 31 can be filled into the opening 30 without leaving any unfilled portioned at the corners of the bottom of the opening 30. Further, just after the liquid-like resin 31 has been coated into the opening of the mask 29, any partially raised resin over the plane of the opening 30 of the mask 29 is moved by the squeegee 25 and, without leaving any unfilled portion, the resin can be readily filled into the opening 30 resin fluidization. Further, while the liquid-like resin 31 is being coated into the opening 30 of the mask 29, the squeegee 25 is moved over the plane of the opening 30 along the surface of the mask 29 and removes any excessive resin 31 and it is possible to form a resin sealing body 32 with high positional accuracy in X, Y, and Z (height) directions. The position and shape of the resin sealing body 32 can be freely set by the shape of the mask 29 and the thickness of the resin sealing body 32 can be freely set by the thickness of the mask 29.

On page 25, line 11, please replace the paragraph beginning with “The cylinder 20 extrudes a liquid-like resin” with the following amended paragraph:

The cylinder 20 extrudes a liquid-like resin from the nozzle section provided on the forward end 62. A plurality of nozzles are usually provided at the forward end 62 of the cylinder 20. As shown in FIG. 11B, three linear nozzles 63 may, in some case, be provided at the forward end 62 of the cylinder 20 or, as shown in FIG. 11C, a plurality of nozzles 63 may be arranged, in some case, in a matrix array on the forward end 62 of the cylinder 20. Though not shown in Figures, a single nozzle is, in some case, provided at the forward end of the cylinder 20. The cylinder 20 serves the purpose of uniformly coating the liquid-like resin while being moved from one edge end to the opposite edge end of the opening of the mask and it is possible to achieve uniform resin coating by using more number of nozzles.